ARCADIS U.S., Inc.
410 N. 44th Street
Suite 1000
Phoenix
Arizona 85008
Tel 602 438 0883
Fax 602 438 0102

TECHNICAL MEMORANDUM

To:
Adalberto Bosque, PhD, MBA, REM, CEA
Response and Remediation Branch
U.S. Environmental Protection Agency
City View Plaza II – Suite 7000
48 RD, 165 Km. 1.2
Guaynabo, PR 00968-8069

Copies:
Tom Wynn, Phillips 66
John Egan, Wyeth LLC
Nathan Blomgren, Chevron EMC
Selene Mojica, Baxter International Inc.
Joe Biss, EHS Support LLC
Dan Vineyard, Jackson Walker L.L.P
Jose Font, USEPA
Mel Hauptman, USEPA

From:
James C. Kirschner, ARCADIS

Date:
March 1, 2015

ARCADIS Project No.:
CO001911.0002

Subject:
Fibers Public Supply Wells Superfund Site, Guayama, Puerto Rico
Summary of Treated Groundwater Discharge Analysis – Percolation Basin
Technical Memorandum

INTRODUCTION

On behalf of the Fibers Public Supply Wells Superfund Site (Site) Settling Defendants (Fibers Group), ARCADIS U.S., Inc. (ARCADIS) has prepared this Technical Memorandum (TM) to evaluate the feasibility of potential Percolation Basin alternatives. In July, 2011, ARCADIS prepared an Evaluation of Treated Groundwater Discharge Alternatives (ARCADIS, 2011) based on requirements specified in the United States Environmental Protection Agency (USEPA) 2009 Five-Year Review (USEPA, 2009). Treated groundwater discharge alternatives were identified in 2011 by evaluating current land use of neighboring properties and surrounding site conditions. Historical investigations and reports initiated by the Fibers Group were reviewed to help identify possible discharge alternatives (Canonie, 1993; USEPA, 1991). Figure 1 presents a Site Vicinity Map. One of the treated groundwater discharge alternatives identified and evaluated by ARCADIS in 2011 was infiltration into a percolation basin (basin) located south of Puerto Rico Highway 3 (PR-3) and west of the Site's former cane field (Figure 2, Site Map Depicting Percolation Basin Investigation Area). The objective of this TM is to provide a document that utilizes historical information and incorporates new data to evaluate the feasibility of a percolation basin for beneficial use of the treated groundwater.

BACKGROUND

Since the 1960s, several industrial facilities have operated in the vicinity of five former Puerto Rico Aqueduct and Sewer Authority (PRASA) public supply wells located in Guayama, Puerto Rico. Shutdown of the former PRASA public supply wells has been attributed to historical releases from these facilities. A Record of Decision (ROD) was issued in September 1991 (USEPA, 1991) selecting a remedy which included pumping impacted groundwater from extraction wells, treatment by sediment/particulate filtration and air stripping, and long-term groundwater monitoring to assess remedy performance.

In 1992, the Fibers Group members entered into a Consent Decree to implement the selected remedy. A Final Design Report was approved in 1995. The 1995 Design Report modified the remedy to include:

- Pumping from five regional extraction wells and two source control wells at a combined rate of 650 gallons per minute (gpm) with a contingency of plus or minus 50%.
- Discharge of treated groundwater to the Patillas Canal or to nearby industrial facilities for reuse.

The groundwater extraction and treatment system (GWETS) was in operation from September 1999 through May 2013. Groundwater was pumped from the five groundwater extraction wells at a combined rate of approximately 400 to 450 gallons per minute (gpm). Approximately 2.88 billion gallons of water has been extracted, treated by air stripping and conveyed to the adjacent Chevron Phillips Chemical Puerto Rico Core, Inc. (CORE) facility for industrial reuse. The treated groundwater discharge can no longer be conveyed to the CORE facility as it has been decommissioned along with its wastewater treatment facility which was demolished in 2014.

The Fibers Group is currently designing an effluent pipeline to convey treated groundwater from a new air stripper remediation system south to the Phillips Ditch which drains into the Las Mareas Harbor and ultimately into the Caribbean Sea and has been used by CORE for the discharge of water since 1967.

SITE DESCRIPTION

The Site is located near Guayama, Puerto Rico, approximately 2 miles north of the Caribbean Sea, along PR-3. The Site encompasses about 540 acres, including a former fibers manufacturing plant, a Baxter International Inc. (Baxter) facility and former cane fields. Wyeth LLC (Wyeth) currently operates a pharmaceutical packaging plant in the former fibers manufacturing plant. Figure 2 presents a Site Map showing the overall layout of the Site and locations of the groundwater extraction wells and treatment compound.

TREATED GROUNDWATER DISCHARGE ANALYSIS – PERCOLATION BASIN

In 2011, ARCADIS conducted a subsurface basin investigation at two areas west of the Site. The investigation was conducted to determine the feasibility of designing and implementing a basin (or basins) to manage the peak estimated treated groundwater discharge rate of 1,000 gpm. Eight soil borings were drilled using the Hydraulic Profiling Tool (HPT) instrumentation in the basin area of investigation to a maximum depth of 31 feet below ground surface (bgs). The approximate locations of the eight HPT soil borings in the basin study area are shown in Attachment 1 (Figure 1; ARCADIS, 2011). HPT instrumentation subsurface measurements were used to estimate soil type and hydraulic conductivity (K) values. Empirical relationships developed from published studies (McCall and Christy, 2010) were utilized to estimate K values using the collected HPT data.

Based on the empirical relationship, horizontal K values within eight HPT soil borings ranged from 1×10^{-2} centimeters per second (cm/sec) to 1×10^{-4} cm/sec (ARCADIS, 2011). Vertical K values can be expected to be an order of magnitude less than the horizontal K values. Thus, the estimated vertical K values can be expected to be within the range of 1×10^{-3} cm/sec to 1×10^{-5} cm/sec.

Based on the estimated range of vertical K values, basins can be sized to manage the peak treated groundwater discharge rate of 500 gpm. The basin sizes calculated below assume that surficial percolation is the only means by which water from the GWETS is allowed to infiltrate. The peak groundwater discharge rate of 500 gpm is based on the replacement air stripper design (approved by EPA on January 28, 2014) that is capable of treating 500 gpm of impacted groundwater. The table below provides a correlation of vertical K values and percolation basin sizes.

Vertical K Values (cm/sec)	Vertical K Values (ft/min)	Discharge Rate (gpm)	Discharge Rate (ft^3/min)	Basin Size (ft^2)	Basin Size (acres)
$1x10^{-3}$	$2x10^{-3}$	500	66.84	33,420	0.77
$1x10^{-4}$	$2x10^{-4}$	500	66.84	334,200	7.67
$1x10^{-5}$	$2x10^{-5}$	500	66.84	3,342,000	76.72

Notes:
ft/min: feet per minute.
ft^3/min: cubic feet per minute.
ft^2: square feet.

Conversions:
1 cm/sec = 1.97 ft/min
1 gpm = 0.134 ft^3/min
1 acre = 43,560 ft^2

The 0.77 acre, 7.67 acre, and the 76.72 acre basins above represent the best case, reasonable best case, and worst case scenarios based on the information available. These scenarios also represent a

uniform/consistent vertical K value for the subsurface soil within the percolation basin. Additional data would be necessary to determine the actual K values at any particular basin location. The following probable costs were determined and developed assuming that each basin will be constructed from 5 feet high earthen embankments and that all labor, materials, and equipment required for construction may be procured locally within Puerto Rico. If importation of labor, materials, and/or equipment is required for construction of the infiltration basin(s), the costs would likely increase dramatically.

The estimated timeline to conduct the design and construction of the percolation basin activity is 12 to 24 months pending coordination with Federal and Commonwealth agencies as well as completion of the activities described in the Necessary Future Actions section.

STAKEHOLDER ACCEPTANCE

The Fibers Group recently met with Puerto Rico Industrial Development Company (PRIDCO) on January 26, 2015 to discuss the concept of constructing a percolation basin on its property. The original contemplated area for the percolation basin in 2011 (see Figure 2 and Attachment 1) has now been improved (i.e., site grading, roadway, utilities, etc.) by PRIDCO and they are actively marketing its commercial development (see recent photos in Figures 3 - 5). PRIDCO expressed that this area is not likely an area it would accept for the construction and long-term use of a percolation basin given its mission to foster economic development on the island as well as its recent investments to improve the property. The Fibers Group also approached the idea with PRIDCO of constructing a percolation basin on the former cane field, south of the GWETS recovery wells. Again, this idea was met with significant reluctance because construction and long-term use of a percolation basin infringes on its ability to commercially develop this site in the future. Further, and as a matter of precedent, PRIDCO established the following position during a July 31, 1997 meeting at the Environmental Quality Board (EQB) office: “the formation of wetlands along our property is not an acceptable option due to the inherent difficulties in developing a property with regulated wetlands on it”. Based on our recent meeting in January, this remains PRIDCO’s position. Attachment 2 includes the letter from PRIDCO to the USEPA (August 19, 1997) addressing these concerns.

The Fibers Group also contacted Wyeth to inquire about placement of an infiltration basin near its operating facility to the north of PR-3 and to the east of the Baxter facility. Wyeth reminded the Fibers Group that it is not the owner of the property and that Wyeth operates under a long-term lease from PRIDCO. Additionally, the open area is currently used by Wyeth for storm water management, and it expressed deep concern with modifying it from its current application.

NECESSARY FUTURE ACTIONS

In order to design a percolation basin for management of the GWETS discharge, additional pre-design data collection would be required. Additional in-situ testing within the former cane field (or any other area

to be considered) would need to be performed to further refine the estimates of K values. The in-situ testing will determine more reliable estimates of vertical K values within the subsurface soils, as well as determine horizontal K values within deeper saturated zones. The horizontal K values will be used to determine if injection wells within the percolation basin would be feasible to increase the infiltration capacity of the percolation basin. The results of additional testing would be utilized within the existing groundwater flow model to assist in determining the required size of a percolation basin and if sufficient area is available within the confines of the former cane field.

In-situ infiltration testing of the surficial soil material would be conducted using a double-ring infiltrometer, in accordance with ASTM D-3385, and would be performed at a frequency of no fewer than 5 tests per acre of the percolation basin. The resulting data would refine the estimates of vertical K values for the surficial soils which can then be used to refine the proposed basin sizing. In addition to the double ring infiltrometer tests, field percolation tests would be performed to assist in the calculation of saturated hydraulic conductivity values. The field percolation tests will be similar to those required by local municipalities for the design and construction of septic systems with leach fields. The number of field percolation tests will be determined at the time of the investigation.

At a minimum, two (2) test drainage wells would be installed in the vicinity of the proposed basin location(s) for the purpose of conducting an aquifer test and to evaluate the potential for using the wells to assist with water infiltration within the basin(s). The wells would be constructed of 4-inch diameter PVC pipe and 20 to 40 feet of stainless steel V-wire wrap screen. It is anticipated that the wells will be constructed in both the upper and lower zones, depending on the actual surface location. Following the aquifer test, an injection test would be conducted to determine the rate at which the water can infiltrate into the subsurface through the wells. The test would evaluate the maximum sustainable flow rate under gravity flow.

The hydraulic data collected above would be used to develop a groundwater flow model for the shallow and deep zones. The existing regional groundwater flow model would be used to help guide the construction of this smaller scale sub-model and would also be used to define flow boundaries for the sub-model. The model would simulate the two zones and would be developed using a USGS MODFLOW groundwater flow simulator similar to the regional model developed by ARCADIS. MODFLOW has the capability of evaluating the effects of recharge from the basins. The model would be used to integrate the infiltration rate data and the hydraulic test data to evaluate the potential size and configuration of the basins, to evaluate the hydraulic effects (water level rise and conveyance of water) in upper and lower zones, to evaluate the size and location of a potential hydraulic barrier which would ultimately affect the groundwater flow direction, and to evaluate whether the drainage wells are necessary and which zones would be the most appropriate for the full scale design.

The estimated timeline to conduct these activities is 12 to 18 months pending coordination with Federal and Commonwealth agencies.

CAPITAL COST/O&M EXPENSES

The estimated costs are provided in Table 1 and are broken in three groups: engineering and construction costs, operation and maintenance costs, and additional upfront data collection costs which will be necessary to design/construct the percolation basin(s). Those additional upfront data collection activities range in cost from $104,500 to $620,400 and are highly dependent on the hydraulic conductivity of the soil. The lower the hydraulic conductivity the more infiltrometer and percolation tests will be required as part of the pre-design work.

The costs associated with the construction activity range from $406,000 to $12,365,400, and are heavily dependent on the additional data that would be collected and evaluated to correctly size the percolation basin. Estimated annual operation and maintenance (O&M) costs range from $222,000 to $336,000 and are also dependent on the actual size of the percolation basin.

REASONABLE BEST CASE ADVANTAGES/DISADVANTAGES/CONSIDERATIONS

The following advantages, disadvantages, and considerations are based on the assumption that the reasonable best case scenario is the most appropriate and realistic. Based on this assumption, the basin(s) would be approximately 7-10 acres (Figure 6) in size, and would utilize some number of injection wells.

Advantages

- Water will be used to recharge the aquifer (Reuse).
- Basin(s) can most likely be designed for maximum desired treated groundwater discharge rate at 500 gpm.
- No restriction on discharge periods.

Disadvantages

- Basin(s) would restrict use of property for other purposes.
- Due to estimated water infiltration rates, a large area is most likely required to construct the basin(s).
- High capital costs are anticipated to construct the basin(s).
- Annual O&M costs range from $222,000 to $336,000.
- The timeframe including the collection of the pre-design data would delay the startup of the new GWETS for approximately 3 to 4 years (Phillips Ditch still necessary as interim option).
- An Explanation of Significant Differences (ESD) or ROD Amendment may be required.

Considerations

Further evaluation and studies are required to complete the design. Trespass into the basin(s) for recreation or illegal dumping is a concern and will need to be controlled by fencing and possibly additional security. The effectiveness of basins also typically decreases with time requiring significant maintenance or relocation of the basin. Implementation of a basin requires design, testing and an access agreement for road crossing and construction.

The percolation basin(s) will also require that an emergency overflow be constructed to alleviate any massive receipt of precipitation from heavy storm events (e.g., tropical storm, hurricane, etc.) or unforeseen issues with infiltration via gravity flow. The Fibers Group will need to continue with its current pipeline construction to the Phillips Ditch in order to have access to an emergency outlet for the percolation basin, if constructed.

CONCLUSION

Although, the design and construction of a percolation basin may be technically feasible, other pertinent considerations need to be included as part of any final determination. As previously stated, PRIDCO is not in favor of a percolation basin on its property as it will affect possible future industrial, agricultural or commercial development. In addition, based on actual vertical K values, the available locations for siting a basin may not be large enough to manage the maximum desired treated groundwater discharge rate at 500 gpm. Additionally, the timeline to obtain the necessary data and design and construct a percolation basin is approximately 3 to 4 years and would delay the startup of the new GWETS. Regardless of any determination on the feasibility of a percolation basin, the Fibers Group will need to continue with its current pipeline construction to the Phillips Ditch in order to have access to an emergency outlet and to restart the GWETS as quickly as possible to control any further plume migration to the west.

REFERENCES

ARCADIS, 2011. Evaluation of Treated Groundwater Discharge Alternatives. July.

Canonie Environmental, 1993. Cost Evaluation Treated Groundwater Re-use Alternatives. August.

McCall, Wesley and Thomas Christy, 2010. Development of a Hydraulic Conductivity Estimate for the Hydraulic Profiling Tool (HPT). Abstract and Presentation, *The 2010 North American Environmental Field Conference & Exposition.* The Nielsen Environmental Field School, Las Cruces, NM. January.

USEPA, 1991. Declaration for Record of Decision. October.

USEPA, 2009. Five-Year Review Report, Fibers Public Supply Wells Site, Guayama, Puerto Rico. September.

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Figures

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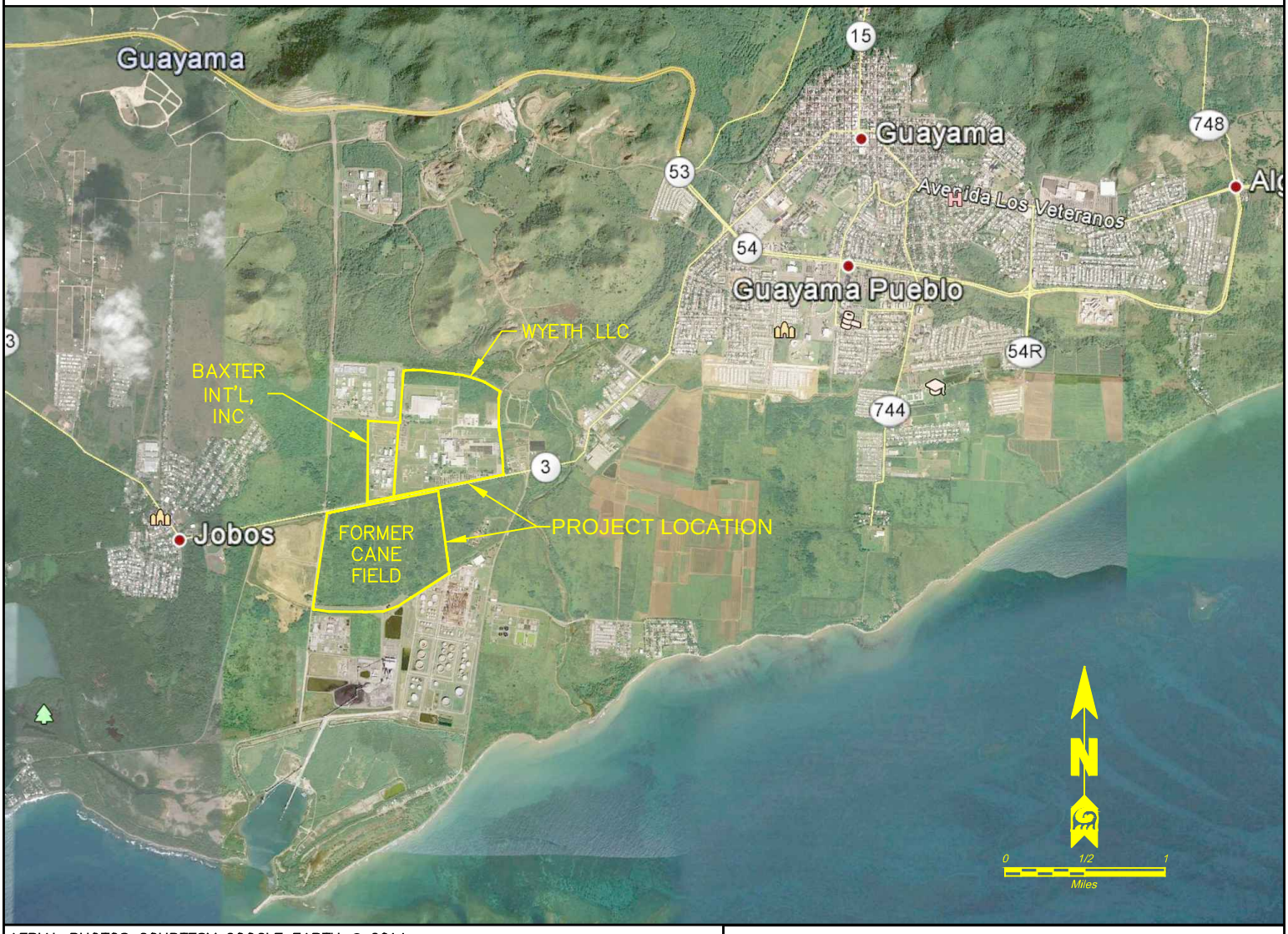

AERIAL PHOTOS COURTESY GOOGLE EARTH © 2014

FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

SITE VICINITY MAP

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FIGURE
1

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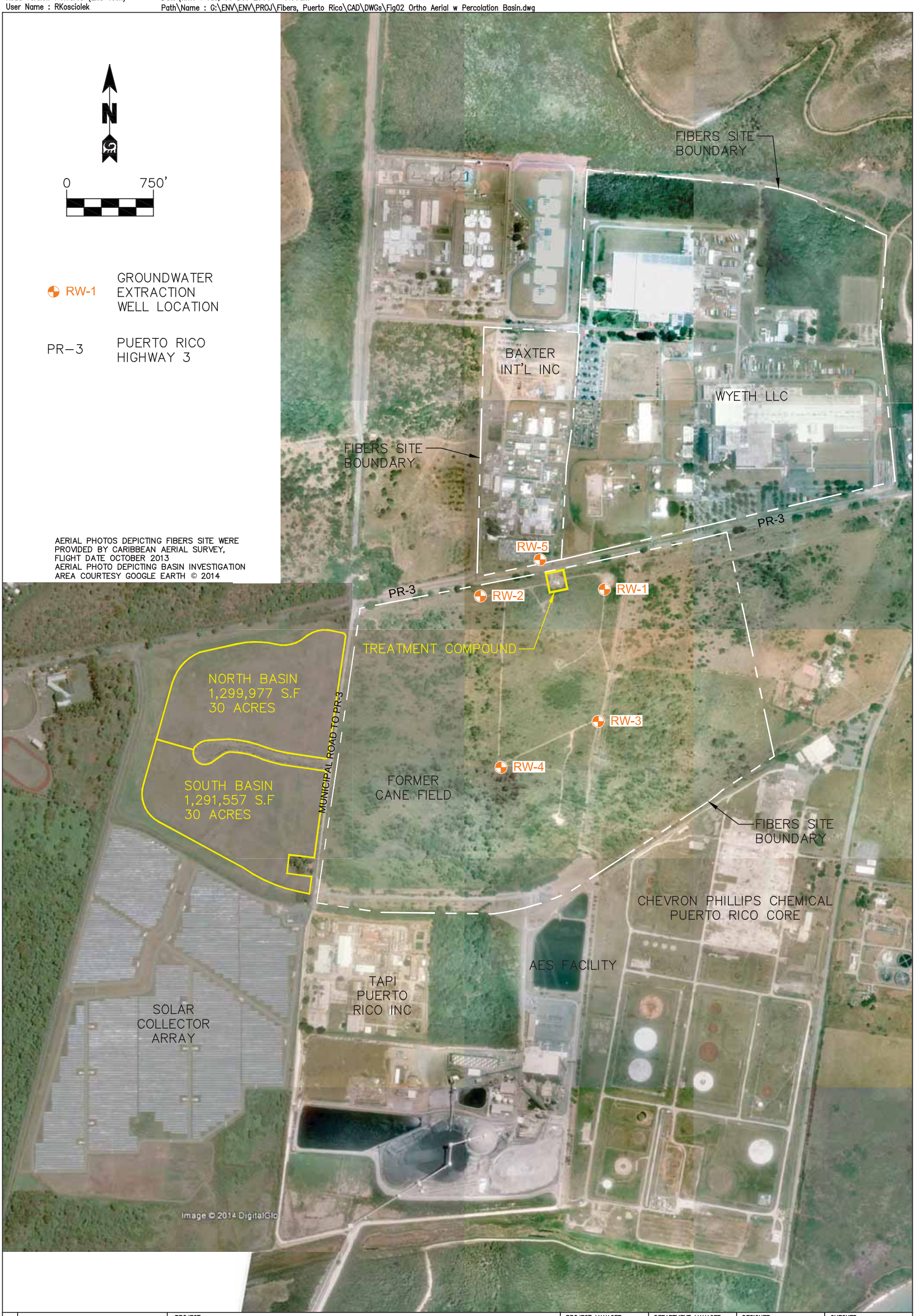

ARCADIS
410 N. 44th ST. Suite 1000
Phoenix, AZ 85008
Tel: 602.438.0883
Fax: 602.438.0102
www.arcadis-us.com

PROJECT

FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

PROJECT MANAGER	DEPARTMENT MANAGER	DESIGNER	CHECKED
J. KIRSCHNER	R. MONGRAIN	R. KOSCIOLEK	D. HOWARD

SHEET TITLE
SITE MAP DEPICTING PERCOLATION BASIN INVESTIGATION AREA

PHASE/TASK NUMBER	DRAWN BY
.0002.1413A	R. KOSCIOLEK

PROJECT NUMBER	FIGURE
CO001911	2

ARCADIS
410 N. 44th ST. Suite 1000
Phoenix, AZ 85008
Tel: 602.438.0883
Fax: 602.438.0102
www.arcadis-us.com

PROJECT TITLE
FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

PROJECT MANAGER	DEPARTMENT MANAGER	DESIGNER	CHECKED
J. KIRSCHNER	R. MONGRAIN	R. KOSCIOLEK	D. HOWARD

SHEET TITLE
PRIDCO DEVELOPMENT SIGNAGE

PHASE/TASK NUMBER	DRAWN BY
.2015	R. KOSCIOLEK

PROJECT NUMBER	FIGURE
CO001911	3

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ARCADIS
410 N. 44th ST. Suite 1000
Phoenix, AZ 85008
Tel: 602.438.0883
Fax: 602.438.0102
www.arcadis-us.com

PROJECT TITLE
FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

PROJECT MANAGER	DEPARTMENT MANAGER	DESIGNER	CHECKED
J. KIRSCHNER	R. MONGRAIN	R. KOSCIOLEK	D. HOWARD

SHEET TITLE
PRIDCO DEVELOPMENT
GATED ENTRANCE

PHASE/TASK NUMBER	DRAWN BY
.2015	R. KOSCIOLEK

PROJECT NUMBER	FIGURE
CO001911	4

ARCADIS
410 N. 44th ST. Suite 1000
Phoenix, AZ 85008
Tel: 602.438.0883
Fax: 602.438.0102
www.arcadis-us.com

PROJECT TITLE
FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

PROJECT MANAGER	DEPARTMENT MANAGER	DESIGNER	CHECKED
J. KIRSCHNER	R. MONGRAIN	R. KOSCIOLEK	D. HOWARD

SHEET TITLE
PRIDCO DEVELOPMENT PROPERTY

PHASE/TASK NUMBER	DRAWN BY
.2015	R. KOSCIOLEK

PROJECT NUMBER	FIGURE
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LEGEND

- PROPERTY BOUNDARY
- PIPELINE
- EASEMENT LINE
- PARCEL BOUNDARY

SOURCES:

ELECTRONIC FILE FROM CARIBBEAN AERIAL SURVEYS, INC.
DATED MARCH 2011.
FILENAME: 2772-ALL-NAD83-METER-ADJUST.
ZONE: 5200-PUERTO RICO/VIRGIN ISLANDS
HORIZONTAL DATUM: STATE PLANES NAD83 U.S. SURVEY FEET
VERTICAL DATUM: NGVD29

N

0 200' 400'

FIBERS PUBLIC SUPPLY WELLS SUPERFUND SITE
GUAYAMA, PUERTO RICO

PROPOSED 10 ACRE TREATED WATER INFILTRATION BASIN

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FIGURE
6

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Attachment 1

Figure 1: Infiltration Basin Investigation Locations

LEGEND

- Hydraulic penetrometer testing (HPT) location
- HPT/soil boring location

NOTES

· Aerial photo source: USGS Seamless Data Distribution.

N

0 400 800 Feet

Scale: 1" = 800'

FIBERS PUBLIC SUPPLY WELLS
GUAYAMA, PUERTO RICO
INFILTRATION BASIN SITING INVESTIGATION

INFILTRATION BASIN INVESTIGATION LOCATIONS

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FIGURE
1

G:\Project\Fibers Puerto Rico\GIS\Projects\Infiltration basin siting investigation\Figure 1 percolation basin locations.mxd 7/19/2011

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Tables

Table 1
Estimate of Probable Costs - Percolation Basin
Fibers Public Supply Wells Site
Guayama, Puerto Rico

		Low High Hydraulic Conductivity (0.77 acres)				Mid Mid Hydraulic Conductivity (7.67 acres)				High Low Hydraulic Conductivity (76.72 acres)			
Item No.	Work Activity	Estimated Quantity	Unit	Unit Price (Material & Labor)	Estimated Cost	Estimated Quantity	Unit	Unit Price (Material & Labor)	Estimated Cost	Estimated Quantity	Unit	Unit Price (Material & Labor)	Estimated Cost
1	Planning	1	LS	$ 40,000	$ 40,000	1	LS	$ 40,000	$ 40,000	1	LS	$ 40,000	$ 40,000
2	Mobilization/Demobilization	1	LS	$ 10,000	$ 10,000	1	LS	$ 50,000	$ 50,000	1	LS	$ 100,000	$ 100,000
3	Site Prep	1	LS	$ 5,000	$ 5,000	1	LS	$ 25,000	$ 25,000	1	LS	$ 200,000	$ 200,000
4	Construction	1	LS	$ 90,000	$ 90,000	1	LS	$ 850,000	$ 850,000	1	LS	$ 10,500,000	$ 10,500,000
5	Piping/Controls	1	LS	$ 185,000	$ 135,000	1	LS	$ 210,000	$ 210,000	1	LS	$ 300,000	$ 300,000
				Construction Subtotal	$ 280,000			Construction Subtotal	$ 1,175,000			Construction Subtotal	$ 11,140,000
				Construction (Price per acre)	$ 363,636			Construction (Price per acre)	$ 153,194			Construction (Price per acre)	$ 145,203
				Engineering Design and Support (15%)	$ 42,000			Engineering Design and Support (10%)	$ 117,500			Engineering Design and Support (3%)	$ 334,200
				Construction Management (20%)	$ 56,000			Construction Management (15%)	$ 176,250			Construction Management (5%)	$ 557,000
				Administrative (10%)	$ 28,000			Administrative (10%)	$ 117,500			Administrative (3%)	$ 334,200
				Total Estimated Construction Cost	$ 406,000			Total Estimated Construction Cost	$ 1,586,250			Total Estimated Construction Cost	$ 12,365,400
1	Routine System O&M (Annual)	1	LS	$ 40,000	$ 40,000	1	LS	$ 40,000	$ 40,000	1	LS	$ 40,000	$ 40,000
2	Piping O&M (Annual)	1	LS	$ 5,000	$ 5,000	1	LS	$ 7,000	$ 7,000	1	LS	$ 10,000	$ 10,000
3	Electrical Costs (Annual)	1	LS	$ 80,000	$ 80,000	1	LS	$ 80,000	$ 80,000	1	LS	$ 80,000	$ 80,000
4	Culvert/Outlet O&M (Annual)	1	LS	$ 10,000	$ 10,000	1	LS	$ 10,000	$ 10,000	1	LS	$ 10,000	$ 10,000
5	Infiltration Basin/Wells O&M (Annual)	1	Each	$ 10,000	$ 10,000	2	Each	$ 10,000	$ 20,000	10	Each	$ 10,000	$ 100,000
6	Sampling (Annual)	1	LS	$ 20,000	$ 20,000	1	LS	$ 20,000	$ 20,000	1	LS	$ 20,000	$ 20,000
7	Reporting (Annual)	1	LS	$ 20,000	$ 20,000	1	LS	$ 20,000	$ 20,000	1	LS	$ 20,000	$ 20,000
				O&M Subtotal (Annual)	$ 185,000			O&M Subtotal (Annual)	$ 197,000			O&M Subtotal (Annual)	$ 280,000
				Contingency (10%)	$ 18,500			Contingency (10%)	$ 19,700			Contingency (10%)	$ 28,000
				Project Management (10%)	$ 18,500			Project Management (10%)	$ 19,700			Project Management (10%)	$ 28,000
				Total Annual O& M Costs	$ 222,000			Total Annual O& M Costs	$ 236,400			Total Annual O& M Costs	$ 336,000
1	Installation of Test Wells	2	Each	$ 35,000	$ 70,000	2	Each	$ 35,000	$ 70,000	10	Each	$ 35,000	$ 350,000
2	Infiltrometer Tests	2	Each	$ 1,500	$ 3,000	35	Each	$ 500	$ 17,500	380	Each	$ 300	$ 114,000
3	Percolation Tests	1	Each	$ 2,000	$ 2,000	3	Each	$ 2,000	$ 6,000	20	Each	$ 2,000	$ 40,000
4	Data Review/ModFlow	1	Each	$ 20,000	$ 20,000	1	Each	$ 30,000	$ 30,000	1	Each	$ 60,000	$ 60,000
				Additional Data Collection Subtotal	$ 95,000			Additional Data Collection Subtotal	$ 123,500			Additional Data Collection Subtotal	$ 564,000
				Project Management (10%)	$ 9,500			Project Management (10%)	$ 12,350			Project Management (10%)	$ 56,400
				Additional Data Collection Total	$ 104,500			Additional Data Collection Total	$ 135,850			Additional Data Collection Total	$ 620,400

Notes/Assumptions

1. Berm construction includes 5 ft. high, 3 ft. wide at top, 1:1 sideslope berm.
2. 2-ft. of rip-rap will be placed on base of basin.
3. No permitting fees or labor development are included.
4. It is assumed that all excavated soils will be used as backfill.
5. It is assumed that the outlet structure materials can be procured in Puerto Rico.
6. This cost estimate represents a preliminary evaluation based on site-specific information collected to date. The intended use is to provide early-stage "order of magnitude" costs to allow for management decisions regarding further courses of action. Utilization of this cost estimate information beyond the stated purpose is not recommended.
7. Cost estimates are based on ARCADIS' past experience and vendor estimates. ARCADIS prepared this estimate using current and generally accepted cost estimation methods. These estimates are based on assumptions concerning future events, and actual costs may be affected by known and unknown risks, including, but not limited to, changes in general economic and business conditions which were unknown to ARCADIS at the time the estimates were prepared, future changes in site conditions, regulatory or enforcement policy changes, and delays in performance. Actual costs may vary from these estimates, and such variations may be material.

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Attachment 2

PRIDCO letter to USEPA,
August 19, 1997

GOVERNMENT OF PUERTO RICO
PUERTO RICO INDUSTRIAL DEVELOPMENT COMPANY

355 Ave. F. D. Roosevelt
San Juan, Puerto Rico 00918

Telephone (809) 758-4747
Fax (809) 250-1500

August 19, 1997

Mr. Adalberto Bosque
Project Manager
Fibers Public Supply Wells Superfund Site
Environmental Protection Agency
Caribbean Field Office
Centro Europa Building
1413 Fernández Juncos Ave.
Santurce, Puerto Rico 00910

Dear Mr. Bosque:

During our meeting at the Environmental Quality Board (EQB) offices on July 31, 1997 PRIDCO presented its concerns related to the possibility of creation or enhancement of wetlands on PRIDCO's property south of PR-3 in Guayama as the result of the proposed discharge to Ohmeda's stormwater channel.

Please do not lose sight of the fact that the wetlands concern is one of a few technical issues involved with the proposed discharge that PRIDCO has identified both to EPA and to the Fibers Settling Defendants (FSD). Although the wetlands concern has been given the most emphasis in our discussions to date, such other issues as the manner in which acetone contamination is to be addressed and the potential impact on PRIDCO's property of receiving inadequately treated water remain to be resolved.

Regarding the wetlands concern, as discussed during the July 31 meeting, the data presented by the FSD in their July 7, 1997 discharge evaluation report and the Capacete Martin and Associates (CMA) preliminary wetland evaluation report (dated July 21, 1997) clearly indicate the following:

- The proposed discharge of treated water into the Ohmeda's channel will create a continuous flow of treated water across PRIDCO's property as opposed to an intermittent stream consisting of stormwater runoff. Even under dry weather infiltration conditions in the area, only a portion of the proposed discharge will infiltrate into the soil along the drainage channel crossing PRIDCO's property. The remainder of the flow will discharge into the wetland areas to the west and south of the PRIDCO property.

- The CMA report documents the observation of oxidized root channels at some of the soil pits within the drainage channel. This could be an indication of historical wetlands areas which may have been eliminated by the implementation of drainage techniques for agricultural purposes. Wetland conditions could revert easily if the hydrologic regime of the channel is modified.

- Wetland areas presently exist at the southern portion of PRIDCO's property and immediately to the west of this property across PR Road 7710.

It is PRIDCO's opinion, based upon the data presented by the FSD and the results of our July 31 meeting that wetlands will likely be created, or enhanced if already existing, along PRIDCO's property. PRIDCO's position was clearly established during the meeting: *"the formation of wetlands along our property is not an acceptable option due to the inherent difficulties in developing a property with regulated wetlands on it"*.

However, if PRIDCO is guaranteed by the FSD that wetlands conditions beyond those which might presently exist on the property will not be created by the proposed discharge, we could consider allowing the flow to traverse the property. Allowing such a condition would be subject to legal terms to be negotiated among PRIDCO and the FSD and would be memorialized into a contract.

At a minimum the following issues must be addressed by the FSD to guarantee that wetlands will not be created or otherwise enhanced within the property:

- Preparation of a wetlands jurisdictional determination (JD) and submittal to the US Army Corps of Engineers.

- Grading plans for the natural channel area to prevent ponding of water and long term saturation of soils along the channel. Uniform channel cross section and channel slope must be provided and maintained.

- Regular operation and maintenance (O&M) program to prevent the accumulation of sedimentation debris and obstructive vegetation growth within the drainage channel. This program must be an integral part of the O&M provisions of the Consent Decree (CD) between EPA and the FSD. The O&M program must include periodic inspections with the participation of EPA, the FSD, PRIDCO and any other government agency with jurisdiction.

- The FSD shall be responsible for obtaining any and all permits and/or endorsements from pertinent agencies with jurisdiction over the activities to be implemented.

- Implementation of and compliance with the O&M program must be governed by the terms and conditions of the CD.

- Renewal of the JD upon expiration.

- Any variance in the area of wetlands on PRIDCO's property, as a result of the proposed discharge, will be documented, and PRIDCO will be compensated for any real or potential adverse impact resulting from the wetlands area variance or creation.

We believe that the inclusion of the above mentioned elements in an *Action Plan* developed by the FSD to address the wetlands issues will assist PRIDCO in determining, whether or not the proposed discharge may represent an unacceptable short and/or long term liability for us.

Cordially yours,

Ramón Sanabria Berríos
Vice President
Development Branch

c: Lourdes C. Rodriguez
Mel Hauptman
Dan Hemker
Paul Wilson
John L. Greenthal
Jorge J. Garcia

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